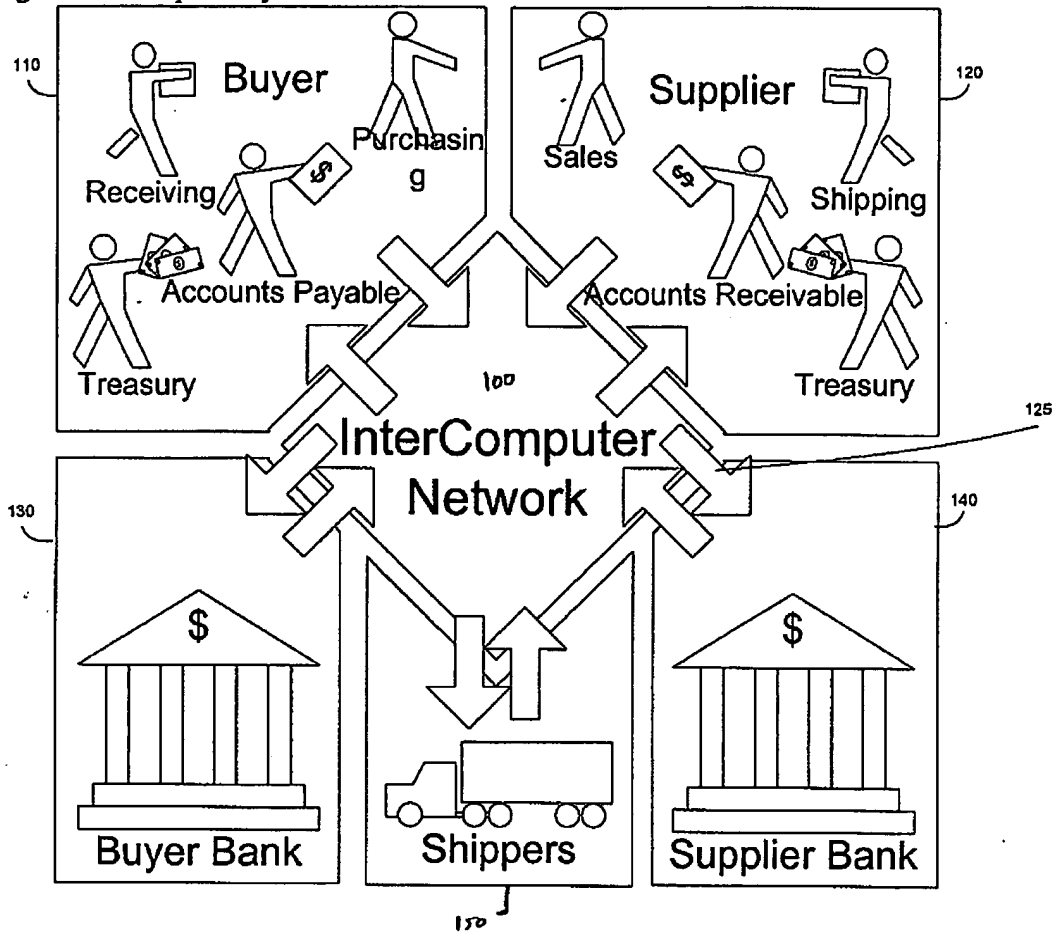


SECURE ELECTRONIC PAYMENT MESSAGING SYSTEM WITH
FINALITY AND CONSISTENCY

Inventor: Bushman et al.

Appl. No.: Unknown Atty Docket: INTCOM.001A

Figure 1 Conceptual System Overview

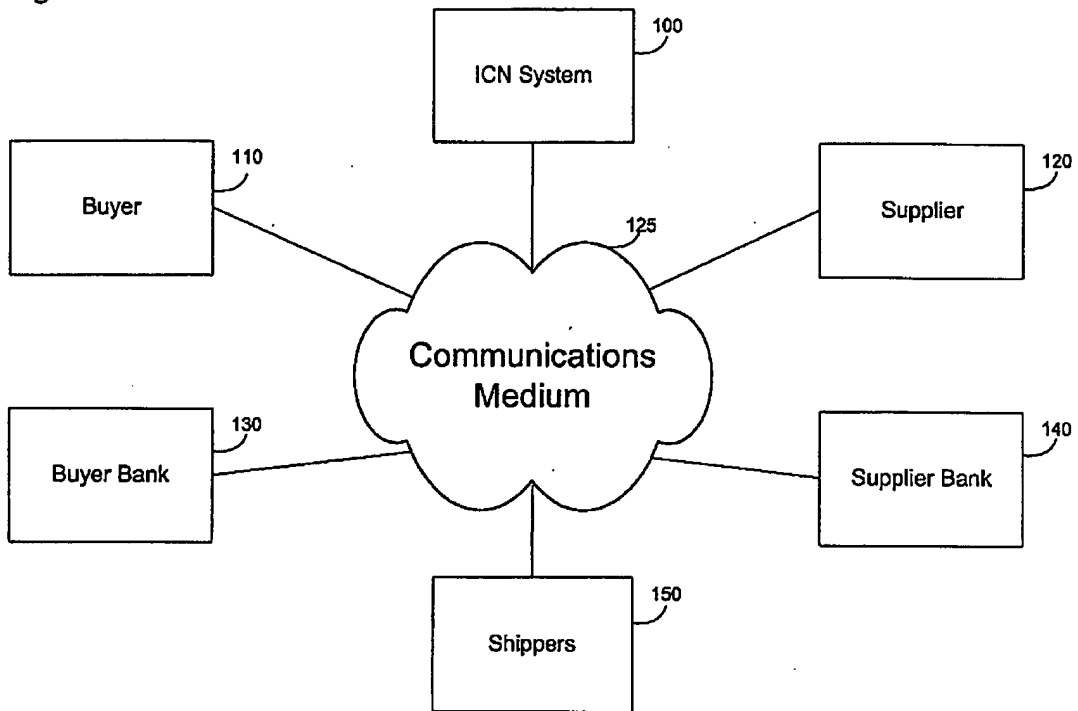


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Figure 1a



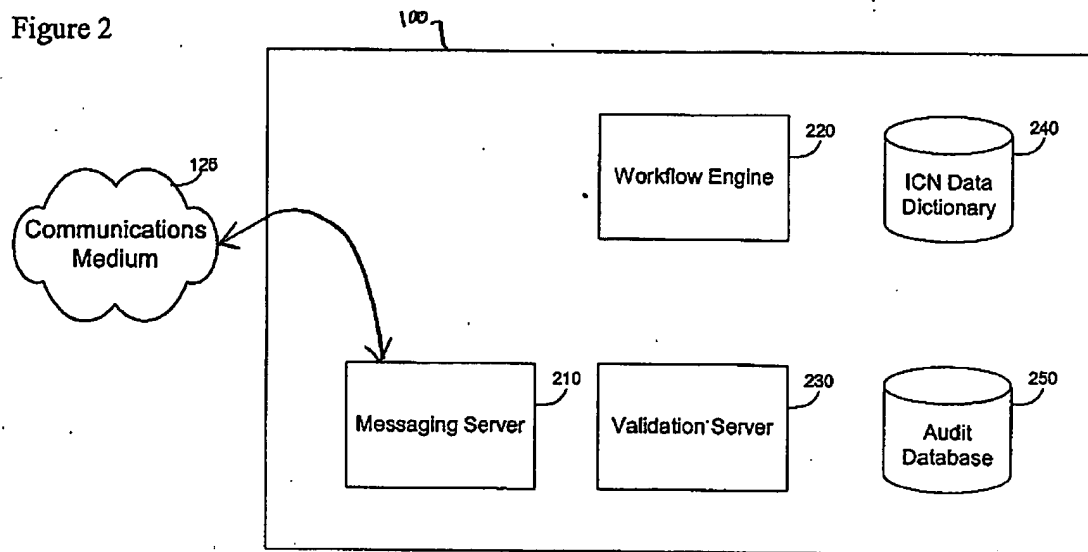
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Figure 2

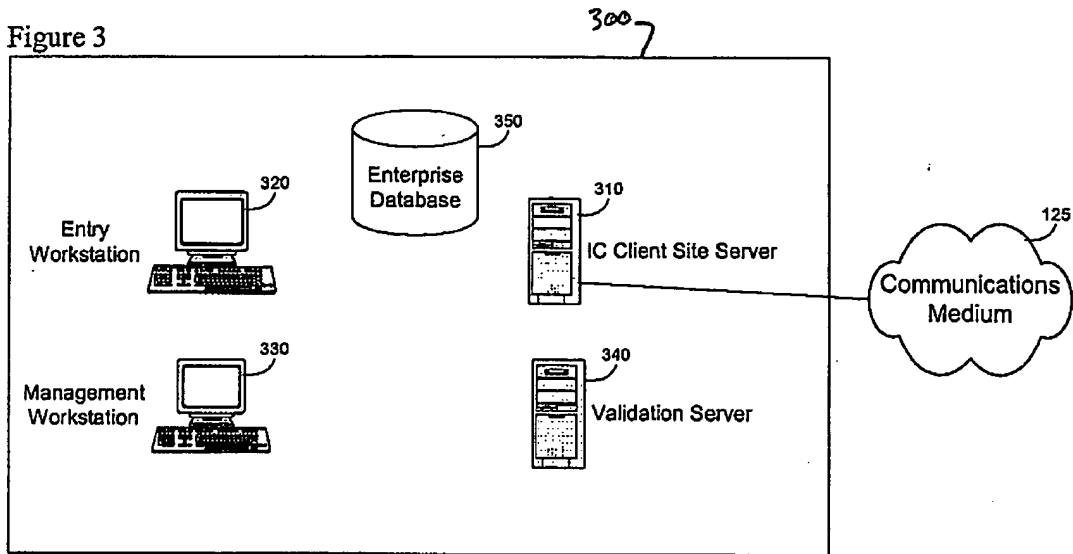


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Figure 3



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Figure 4. High Level Messaging Process Diagram – Message Creation and Transmission

Sender of message	ICN High Level Process	Step Number
(Logon)	VPN established or activated with sender	1
Entry workstation login		2
Message created		3
Message audit file created		4
	Message audit file received	5
Signed & encrypted message sent to ICN		6
	Message received	7
	Validity of message checked by comparing audit file and encrypted message	8
	Message validation response created	9
Message validation response received		10
	VPN inactive	11

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Figure 5. High Level Messaging Process Diagram – Send a message with Approval

Sender f message	ICN High Level Process	Step Number
(Logon)	VPN established or activated with sender	1
Entry workstation login		2
Message created		3
Message audit file created		4
	Message audit file received	5
Management workstation login		6
Message approval created		7
Message approval audit file created		8
	Message approval audit file received	9
Signed & encrypted message sent to ICN		10
	Message received	11
Signed & encrypted message approval sent to ICN		12
	Message approval received	13
	Validity of message checked by comparing message audit file, encrypted message, message approval audit file, and encrypted message approval.	14
	Message validation response created	15
Message validation response received		16
	VPN inactive	17

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Figure 6. High Level Messaging Process Diagram – Receive a message

ICN High Level Process	Recipient of message	Step Number
VPN established or activated with receiver	(Logon)	1
	Entry workstation login	2
	Message received	3
	Message receipt audit file created	4
Message receipt audit file created		5
	Signed & encrypted message receipt acknowledgement sent to ICN	6
Message receipt acknowledgment received		7
Validity of response checked by comparing message receipt audit file and encrypted message receipt acknowledgement.		8
Message validation response created		9
	Message validation response received	10
VPN inactive		11

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Figure 7. High Level Messaging Process Diagram – Receive a Message with Approval

ICN High Level Process	Recipient of message	Step Number
VPN established or activated with receiver	(Logon)	1
	Entry workstation login	2
	Message received	3
	Message receipt audit file created	5
Message receipt audit file created		6
	Management workstation login	7
	Message receipt approved	8
	Message receipt approval audit file created	9
Message receipt approval audit file created		10
	Signed & encrypted message receipt acknowledgement sent to ICN	11
Message receipt acknowledgment received		12
	Signed & encrypted message receipt approval acknowledgement sent to ICN	13
Message receipt approval acknowledgment received		14
Validity of response checked by comparing message receipt audit file, encrypted message receipt acknowledgement, message receipt approval audit file, and encrypted message receipt approval acknowledgement.		15
Message validation response created		16
	Message validation response received	
VPN inactive		17

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Figure 8. Low Level Messaging Process Diagram – Reject a Message

Sender of message	ICN High Level Process	Recipient of message	Step Number
	VPN established or activated with receiver	(Logon)	1
		Entry workstation login	2
		Message received	3
		Message reject audit file created	4
	Message reject audit file created		5
		Signed & encrypted message reject sent to ICN	6
	Message reject received		7
	Validity of response checked by comparing message reject audit file and encrypted message reject acknowledgement.		8
	Message validation response created		9
		Message validation response received	10
	Message reject signed and encrypted and sent to sender		11
	VPN established or activated with receiver	(Logon)	12
Message reject received			13
	VPN inactive		14

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Figure 9. Low Level Messaging Process Diagram – Reject with Approval

Sender of message	ICN High Level Process	Recipient of message	Step Number
	VPN established or activated with receiver	(Logon)	1
		Entry workstation login	2
		Message received	3
		Message reject audit file created	4
	Message reject audit file created		5
		Signed & encrypted message reject sent to ICN	6
	Message reject received		7
		Entry workstation login	2
		Message received	3
		Message reject audit file created	4
	Message reject audit file created		5
		Signed & encrypted message reject sent to ICN	6
	Message reject received		7
	Validity of response checked by comparing message reject audit file and encrypted message reject acknowledgement.		8
Message reject received	Message validation response created		9
		Message validation response received	10
	Message reject signed and encrypted and sent to sender		11
	VPN established or activated with receiver	(Logon)	12
			13
	VPN inactive		14

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Figure 10. Request for Quote

Buyer Transaction State	ICN Transaction State	Supplier Transaction State	Step Number
--------------------------------	------------------------------	-----------------------------------	--------------------

Request for quote (RFQ) initiated	RFQ Initiated		1
	RFQ Forwarded	RFQ Received	2
	Quote received	Quote sent	3
Quote received	Quote forwarded		4

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Figure 11. Order Process Diagram

Buyer Transaction State	ICN Transaction State	Supplier Transaction State	Step Number
Order initiated	Order Initiated		1
	Order Forwarded	Order Received	2
Order Related Chat Message Sent	Order Related Chat Message Received		3
	Order Related Chat Message Forwarded	Order Related Chat Message Received	4
	Order Related Chat Message Received	Order Related Chat Message Sent	5
Order Related Chat Message Received	Order Related Chat Message Forwarded		6
Order Updated	Order Update Received		7
	Order Update Forwarded	Order Update Received	8
	Order Acknowledgement Received	Order Acknowledged	9
Order Acknowledged	Order Acknowledgement Sent		10

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Figure 12. Order Process Diagram – Reject Order

Buyer Transaction State	ICN Transaction State	Supplier Transaction State	Step Number
Orders can be rejected by the supplier at any point in the process after the Supplier has received the initial order and before an acknowledgement is made.			1
	Order Reject Received	Order Rejected	2
Order Rejected	Order Reject Forwarded		3

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Figure 13. Invoice Process Diagram

Buyer Transaction State	ICN Transaction State	Supplier Transaction State	
	Invoice Received	Invoice Initiated	1
Invoice Received	Invoice Forwarded		2
	Invoice Related Chat Message Received	Invoice Related Chat Message Sent	3
Invoice Related Chat Message Received	Invoice Related Chat Message Forwarded		4
Invoice Related Chat Message Sent	Invoice Related Chat Message Received		5
	Invoice Related Chat Message Forwarded	Invoice Related Chat Message Received	6
	Invoice update received	Invoice Updated	7
Invoice Updated	Invoice update forwarded		8
Invoice Acknowledged	Invoice acknowledgement received		9
	Invoice acknowledgement forwarded	Invoice Acknowledged	10

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Figure 14. Invoice Process Diagram – Reject Invoice

Buyer Transaction State	ICN Transaction State	Supplier Transaction State	
			1
Invoice can be rejected by the buyer at any point in the invoice process before an acknowledgement is made.			2
Invoice Rejected	Invoice reject received		3
	Invoice reject forwarded	Invoice rejected	4

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Figure 15. Delivery Process Diagram

Buyer State	Transaction	ICN State	Transaction	Supplier Transaction State	Shipper State	Step Number
		Delivery Received	Ticket	Delivery Ticket Sent		1
		Delivery Forwarded	Ticket		Delivery Ticket Received	2
		Delivery Acknowledgment Received	Ticket		Delivery Ticket Acknowledgment Sent	3
		Delivery Acknowledgment Forwarded	Ticket	Delivery Ticket Acknowledgment Received		4
Delivery Notification Received	Ticket	Delivery Notification Sent	Ticket			5
		Title Received	Transfer	Title Transfer Sent		6
		Title Forwarded	Transfer		Title Transfer Received	7
		Title Acknowledgment Received	Transfer		Title Transfer Acknowledged	8
		Title Acknowledgment Forwarded	Transfer	Title Transfer Acknowledgment Received		9
		Status Received	Update		Status Update sent	10
Status Received	Update	Status Forwarded	Update	Status Update Received		11
		Delivery Received	Ticket		Delivery Ticket Sent	12
Delivery Received	Ticket	Delivery Forwarded	Ticket			13
Delivery Acknowledgment Sent	Ticket	Delivery Acknowledgment Received	Ticket			14
		Delivery Acknowledgment Forwarded	Ticket		Delivery Ticket Acknowledgment Received	15
		Delivery Notification Sent	Ticket	Delivery Ticket Notification Received		16
		Title Received	Transfer		Title Transfer Sent	17

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FIGURE 15-2

Title Transfer Received	Title Transfer Forwarded			18
Title Transfer Acknowledged	Title Transfer Acknowledgement Received			19
	Title Transfer Acknowledgement Forwarded		Title Transfer Acknowledgement Received	20
Delivery Acknowledgement Sent	Delivery Acknowledgement Received			21
	Delivery Acknowledgement Forwarded	Delivery Acknowledgement Received	Delivery Acknowledgement Received	22

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Figure 16. Delivery Process Diagram – Rejected by Shipper

Buyer State	Transaction State	ICN Transaction State	Supplier Transaction State	Shipper State	Step Number
				Deliveries can be rejected by the shipper any time after a Delivery Ticket or a Title Transfer is received and before the Title Transfer is Acknowledged. If there is not title transfer to the shipper, then the rejection must occur before the Delivery Ticket is acknowledged.	1
		Delivery Reject Received		Delivery Reject Sent	2
		Delivery Reject Forwarded	Delivery Reject Received		3
Delivery Cancellation Received		Delivery Cancellation Sent			4

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Figure 17. Delivery Process Diagram – Rejected by Receiver

Buyer Transaction State	ICN Transaction State	Supplier Transaction State	Shipper State	Step Number
Deliveries can be rejected by the Buyer any time after a Delivery Ticket or a Title Transfer is received and before the Title Transfer is Acknowledged. If there is not title transfer to the shipper, then the rejection must occur before the Delivery Ticket is acknowledged.				1
Delivery Reject Sent	Delivery Reject Received			2
	Delivery Reject Forwarded		Delivery Reject Received	3
	Delivery Cancellation Sent	Delivery Cancellation Received		4

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Figure 18. Payment Process Diagram

Buyer	Buyer Bank	ICN	Supplier Bank	Supplier	Step Number
Payment Request Made		Received Payment Request			1
	Receive Payment Request	Forward Payment Request			2
		Forward Payment Notice		Received Payment Notice	3
	Send Payment Response	Payment Response Received from Buyer Bank			4
Payment Response Received		Payment Response Forwarded to Buyer			5
	Send Payment Request to Supplier Bank	Payment Request Received from Buyer Bank			6
		Payment Request Forwarded to Supplier Bank	Received Payment Request		7
Notice of Payment Request Forwarded to Supplier Bank		Payment Request Forwarding Notification sent to Buyer			8
		Payment Response received from Supplier Bank	Send Payment Response to Buyer Bank		9
	Received Supplier Bank Payment Response	Payment Response forwarded to Buyer Bank			10
Supplier Bank Payment Response received		Payment Response forwarded to Buyer			11
		Payment Response Forwarded to Supplier		Payment Response Received	12
		Remittance		Remittance	13

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FIGURE 18-2

		Forwarded to Supplier		Received	
		Payment Acknowledgeme nt received		Payment Acknowledgeme nt sent to Buyer	14
Payment Acknowledgme nt received		Payment Acknowledgeme nt forwarded			15

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Figure 19. Payment Process Diagram – Rejected by Buyer Bank

Buyer	Buyer Bank	ICN	Supplier Bank	Supplier	Step Number
Payment Request Made		Received Payment Request			1
	Receive Payment Request	Forward Payment Request			2
		Forward Payment Notice		Received Payment Notice	3
	Send Payment Response Payment Response is to reject payment	Payment Response (rejected) Received from Buyer Bank			4
Payment Response (rejected) Received		Payment Response Forwarded to Buyer			5
		Payment Cancellation sent to Supplier		Payment Cancellation Received	6

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Figure 20. Payment Process Diagram – Rejected by Supplier Bank

Buyer	Buyer Bank	ICN	Supplier Bank	Supplier	Step Number
Payment Request Made		Received Payment Request			1
	Receive Payment Request	Forward Payment Request			2
		Forward Payment Notice		Received Payment Notice	3
	Send Payment Response	Payment Response Received from Buyer Bank			4
Payment Response Received		Payment Response Forwarded to Buyer			5
	Send Payment Request to Supplier Bank	Payment Request Received from Buyer Bank			6
		Payment Request Forwarded to Supplier Bank	Received Payment Request		7
Notice of Payment Request Forwarded to Supplier Bank		Payment Request Forwarding Notification sent to Buyer			8
		Payment Response (Reject) received from Supplier Bank	Send Payment Response (Reject) to Buyer Bank		9
	Received Supplier Bank Payment Response (Reject)	Payment Response (Reject) forwarded to Buyer Bank			10
Supplier Bank Payment Response (Reject) received –		Payment Response (reject) forwarded to Buyer			11

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FIGURE 20-2

payment cancelled					
		Payment Cancellation sent to Supplier		Payment Cancellation Received	12

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Figure 21. Payment Process Diagram – Rejected by Supplier before payment request is sent to Buyer Bank

Buyer	Buyer Bank	ICN	Supplier Bank	Supplier	Step Number
Payment Request Made		Received Payment Request			1
	Receive Payment Request	Forward Payment Request			2
		Forward Payment Notice		Received Payment Notice	3
		Payment Rejection Received		Payment Rejected	4
Payment Rejection Forwarded		Forward Payment Rejection			5

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Figure 22. Payment Process Diagram – Rejected by Supplier after payment request is sent to Buyer Bank

Buyer	Buyer Bank	ICN	Supplier Bank	Supplier	Step Number
Payment Request Made		Received Payment Request			1
	Receive Payment Request	Forward Payment Request			2
		Forward Payment Notice		Received Payment Notice	3
	Send Payment Response	Payment Response Received from Buyer Bank			4
Payment Response Received		Payment Response Forwarded to Buyer			5
	Send Payment Request to Supplier Bank	Payment Request Received from Buyer Bank			6
		Payment Request Forwarded to Supplier Bank	Received Payment Request		7
Notice of Payment Request Forwarded to Supplier Bank		Payment Request Forwarding Notification sent to Buyer			8
		Payment Response received from Supplier Bank	Send Payment Response to Buyer Bank		9
	Received Supplier Bank Payment Response	Payment Response forwarded to Buyer Bank			10
Supplier Bank Payment Response received		Payment Response forwarded to Buyer			11
		Payment Response		Payment Response	12

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FIGURE 22-2

		Forwarded to Supplier		Received	
		Remittance Forwarded to Supplier		Remittance Received	
		Payment Reject received		Payment Reject sent	
Payment Reject Received		Payment Reject Forwarded			
		Payment Reversal initiated. Money is moved from Supplier Bank Back to Buyer Bank using the same method that money was moved to the Supplier Bank. Buyer cannot reject that movement of money.			

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Figure 23. Authentication Process

Sender Workstation	Sender ICN client site application. server	Sender ICN client site validation server	ICN process	Recipient	Step Number
		Logon (Server to server)			1
			Establish VPN with buyer		2
Login (Client to server)	Login (Client to server)	Session registration and authentication for individual accountability: ICN remote site application server to security server			3
Creates order (or request for quote)					4
Local audit once order ready					5
			Receipt of WS audit file then audit file decryption and database file		6
WS send encrypted data to app. Server					7
	Decryption of order data then Reflection to management WS				8
Management WS validates order					9
Sends order					10
Local audit once					11

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FIGURE 23-2

order validated						
				Receipt of WS audit file then audit file decryption and data base file		12
WS send encrypted data to app. Server						13
	Decryption of order data then...					14
	sent to validation server with Supplier's ID					
		Decryption of order data then				15
		Option 1-total confidentiality: Negotiate Supplier's symmetric key for data exchange and encrypt	Option-total confidentiality: Negotiate Supplier's symmetric key for data exchange and encrypt	Option-total confidentiality : Give symmetric key for data exchange and encrypt		16
		Option 2- data path through: Sign hash of the message with ICN public key				17
			Order received			18
			Order decryption and data integrity resolution via hash comparision and data audit comparison completed			19
			Order data acknowledged			20

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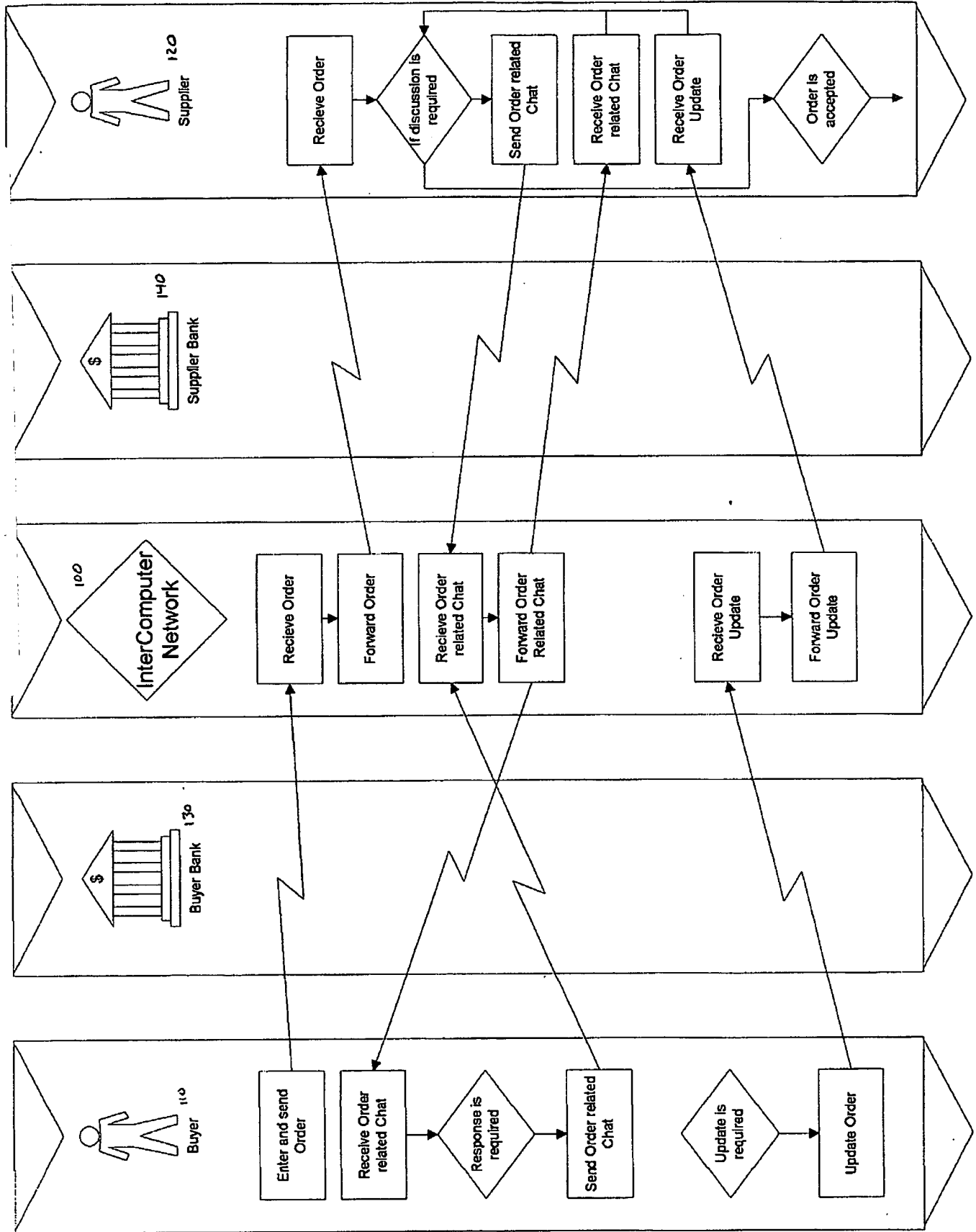
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FIGURE 23-3

		with receipt message		21
		Order and receipt sent		
	Receipt message received		Receives order	22
		VPN inactive		23

FIGURE 24



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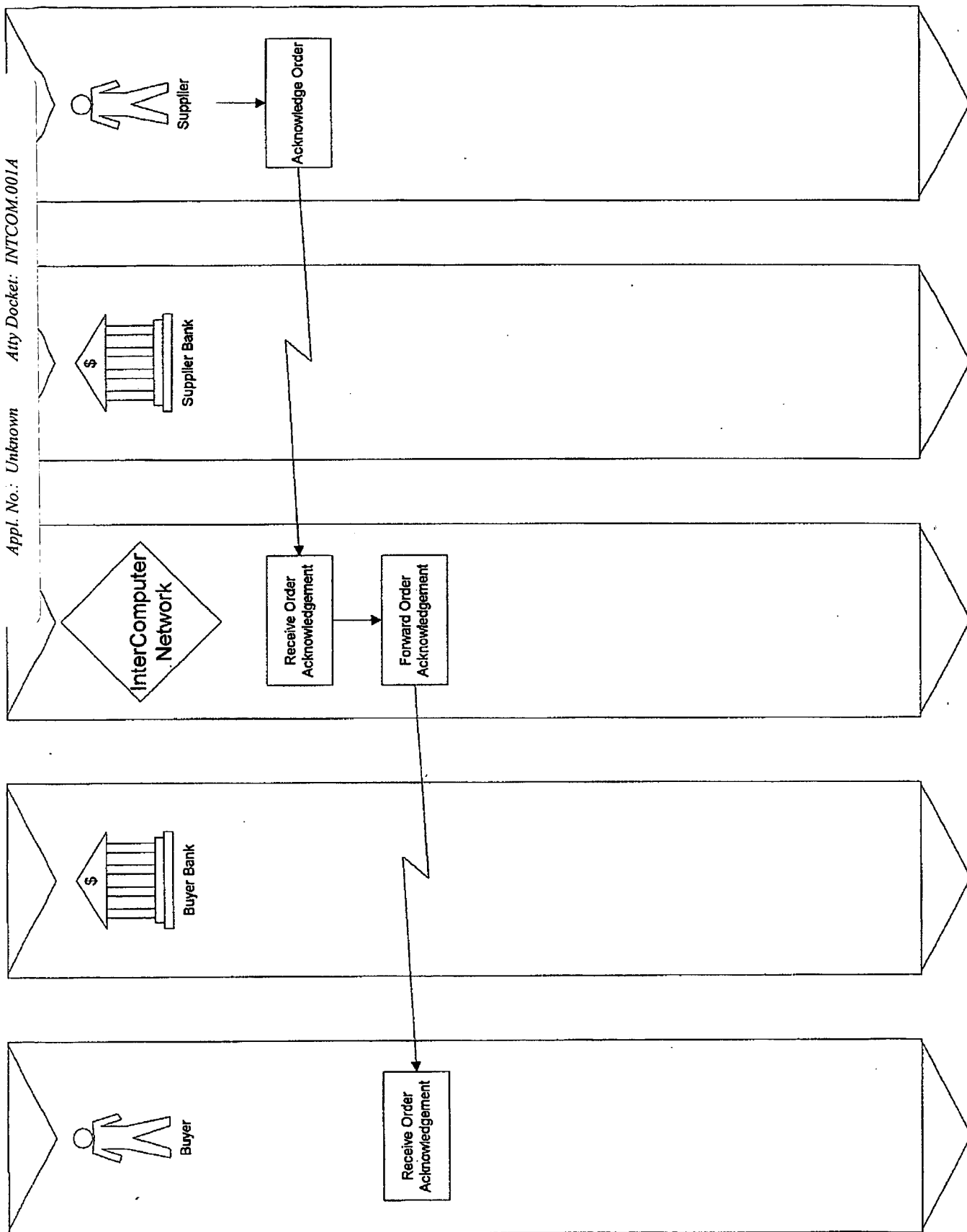


FIGURE 24-2

Figure 25

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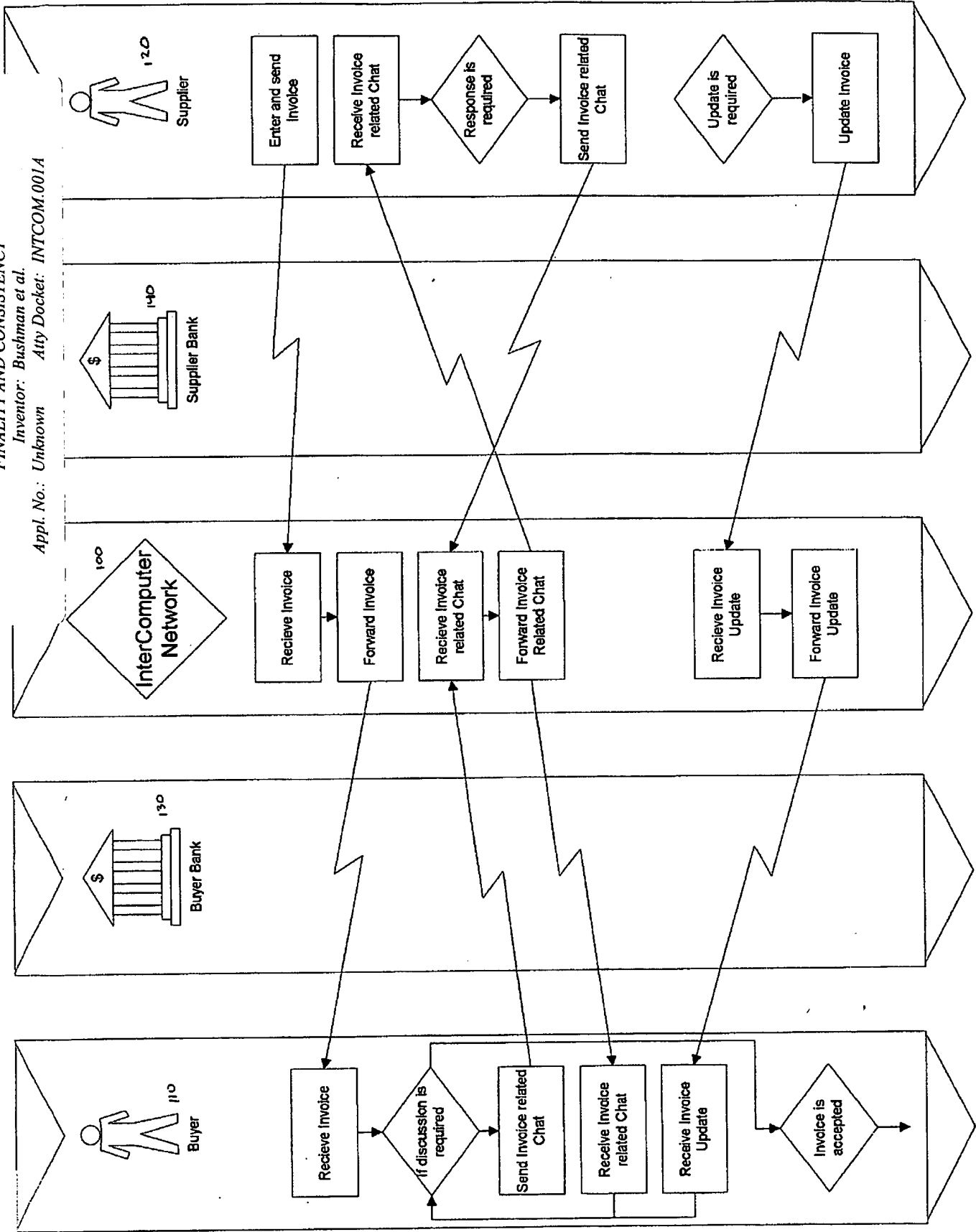


Figure 25-2

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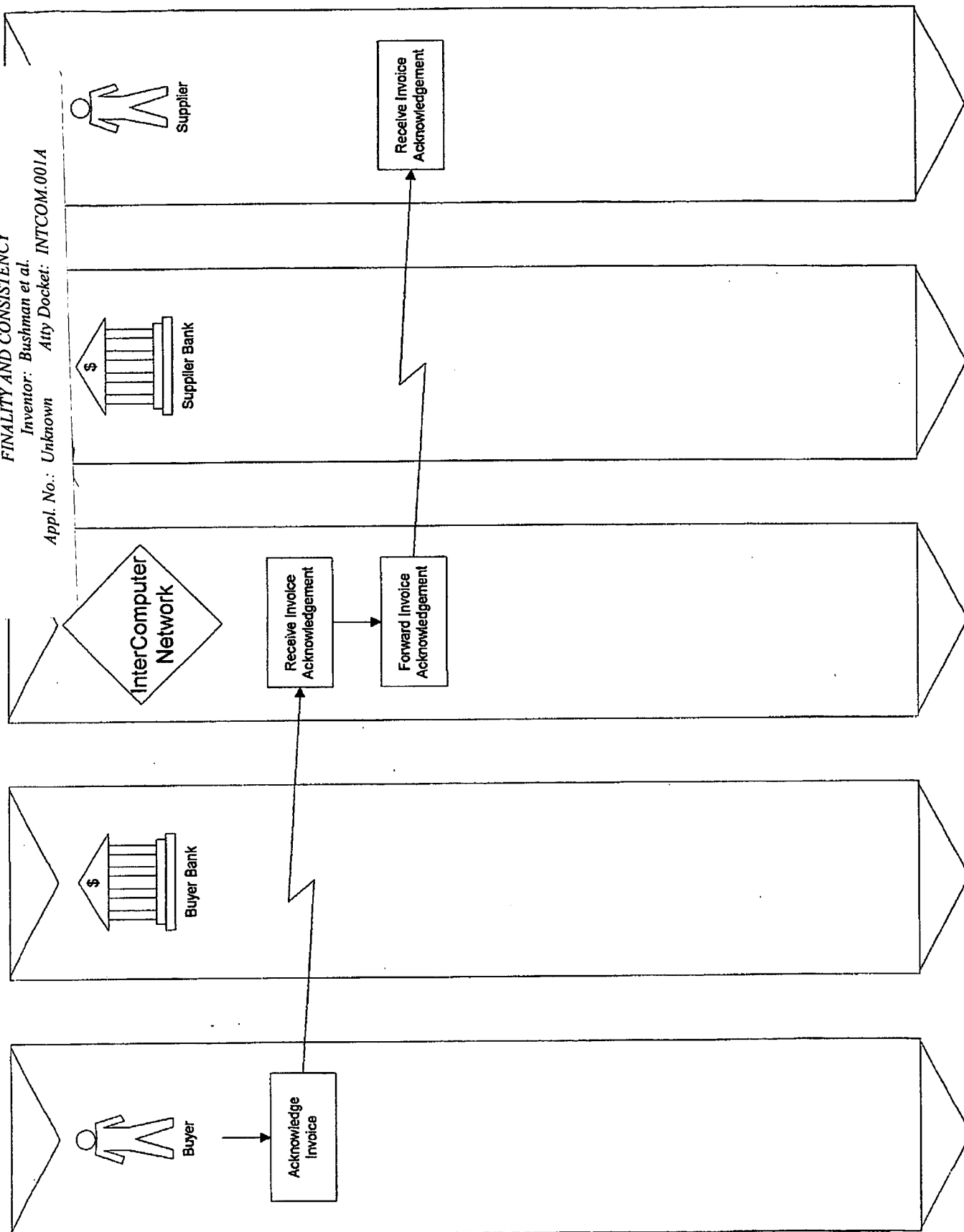


FIGURE 26

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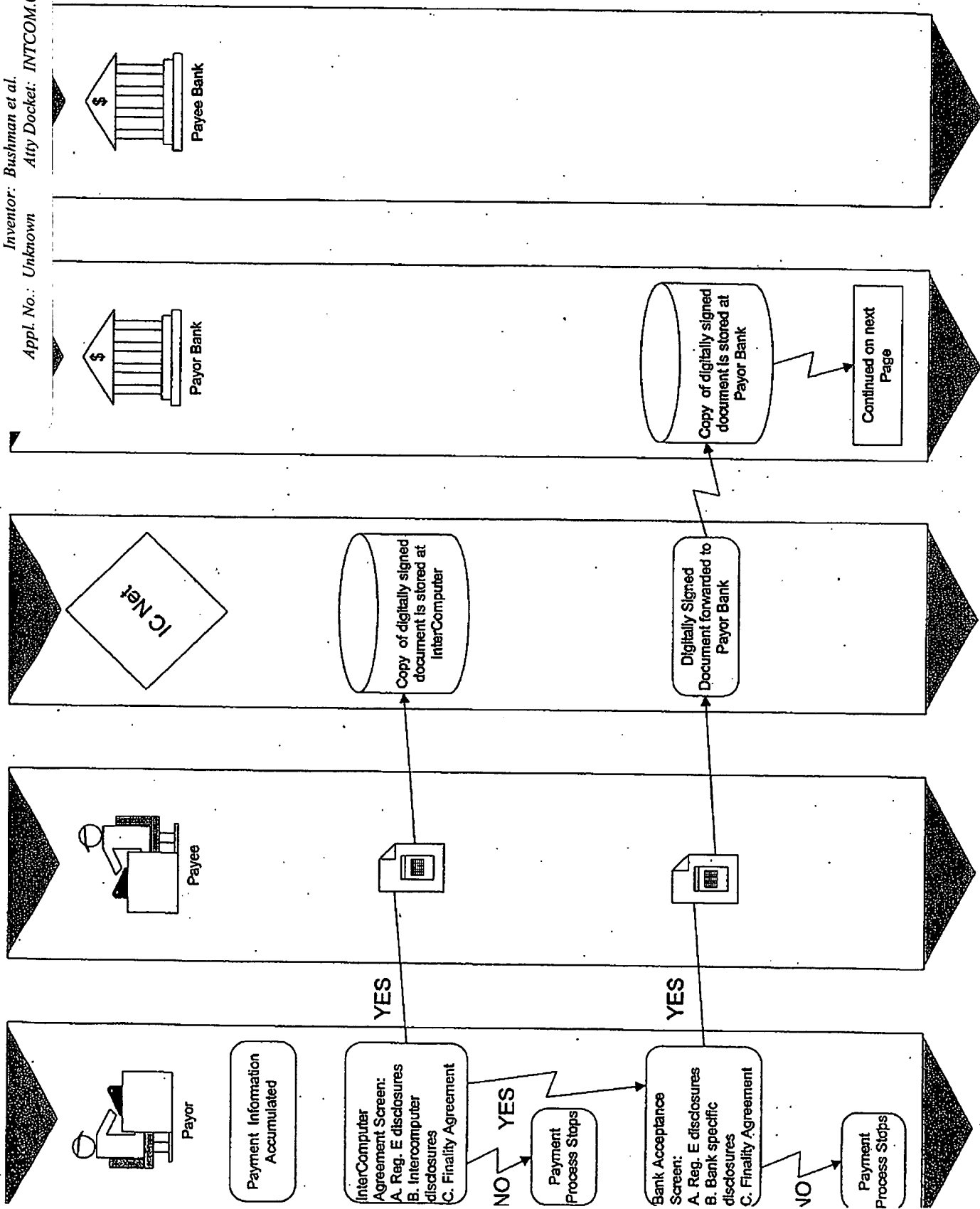


Figure 26-2

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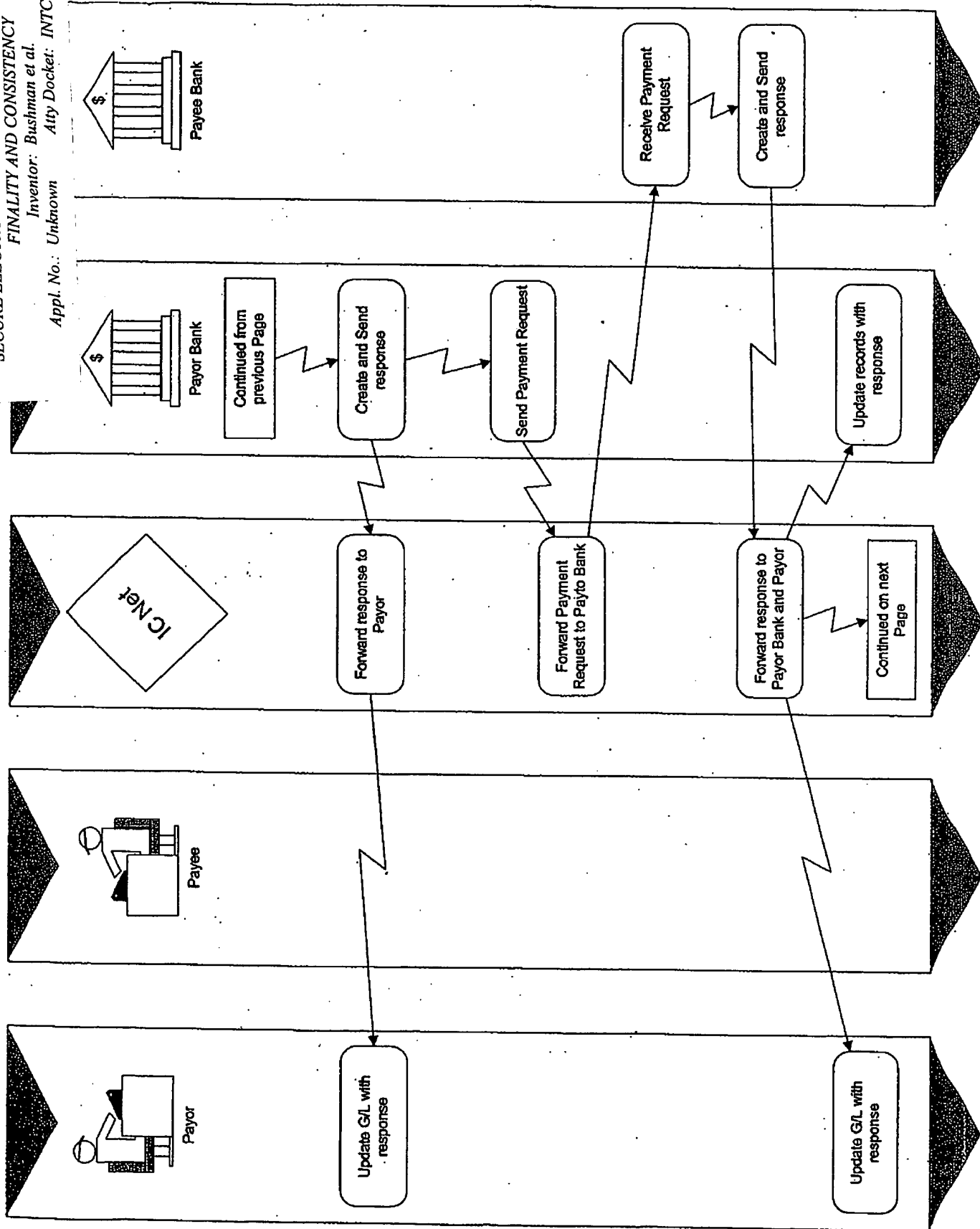


FIGURE 26-3

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